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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

November 26, 1997

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 20554

Re: **CC Docket No. 96-45; Federal-State Joint Board on Universal Service**
CC Docket No. 97-160; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs

Dear Ms. Salas:

Enclosed herewith for filing are the original and four (4) copies of AT&T Corp.'s and MCI Telecommunications Corporation's Comments in the above-captioned proceeding.

Please acknowledge receipt by affixing an appropriate notation on the copy of the Comments furnished for such purpose and remit same to the bearer.

Sincerely yours,

Chris Frentrup

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MCI Telecommunications Corporation

Enclosure

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs	)	CC Docket No. 97-160

COMMENTS OF AT&T CORP. AND MCI TELECOMMUNICATIONS CORPORATION

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MCI Telecommunications Corporation

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COMMENTS OF AT&T CORP. AND
MCI TELECOMMUNICATIONS CORPORATION

AT&T Corp. (AT&T) and MCI Telecommunications Corporation (MCI) hereby submit their comments regarding the Hybrid Cost Proxy Model (HCPM) released by the Commission. The HCPM was made available by Public Notice, and is described as an "engineering process mechanism" developed by several Commission staff members and contractors to represent "potential approaches to customer location and outside plant design issues."[1] The Commission made available the program code, the default inputs used, and the documentation for the current model, including descriptions of revisions that are expected in the near

1 See Common Carrier Bureau Makes Available Potential Modules for Determining Customer Location and Outside Plant Design in Forward-Looking Mechanism for Determining Universal Service Support for Non-Rural Carriers, Public Notice, DA 97-2311, released October 31, 1997 (Public Notice).

future. Because the input values used in the HCPM are described as illustrative only, and because the input values used in any cost model will be addressed in the next phase of this proceeding, AT&T and MCI restrict their comments to the modeling approach taken in the HCPM.

I. THE HCPM CUSTOMER LOCATION ALGORITHM NEEDS FURTHER REFINEMENT

To determine customer location, the HCPM creates a set of grids, whose size is determined by engineering and population density criteria. The current default criteria are 18 kilofeet square grid cells, which conforms to the current Bellcore standard for analog copper loops capable of supporting high quality voice and analog data services, and approximately 2000 lines, because that is the maximum number of lines that can be served by one serving area interface (SAI). Once the location of the grids has been determined, these grids are themselves divided into "microgrids" equal in size to the average Census Block (CB) within the grid. The micrsame grid cell containing the interior point of each CB is determined, and the population of the CB is assumed to be uniformly distributed within that microgrid cell.

AT&T and MCI have two concerns with this approach. First, as the modelers themselves recognize,[2] for CBs larger than a single microgrid cell, assigning the entire population of the CB to the microgrid cell that contains the interior point of the

[2] See Section 3.3 of The Hybrid Cost Proxy Model: Customer Location and Loop Design Modules, (HCPM Documentation), October 30, 1997.

CB may result in insufficient plant being built due to excessive clustering of customer locations. This could occur e.g., in a larger-than-average CB with a population that was in fact uniformly distributed, but which covered an area more than one microgrid cell in size. In such a case, the population of the CB would be assigned to only one microgrid cell, and insufficient plant would be built by the model.

In the documentation of the HCPM, the modelers suggest that the next release of the HCPM will avoid this problem by dividing CBs that are larger than the 18 kilofeet square grids into smaller units, creating interior points for these smaller units, and assigning the population to the microgrid cell in which the interior points of the smaller units lie. While this may reduce the problem, it is unclear how the modelers intend to determine the correct number of subdivisions of the CB. Also, it does not appear that this will cure the problem that exists when a CB is larger than a microgrid, but still smaller than the 18 kilofoot square grid. Furthermore, even if the model places a CB's population into the appropriate microgrid cell, these cells can be quite large (up to 18 kilofeet by 18 kilofeet, or 12 square miles). It then becomes vital to determine whether customers are indeed spread uniformly over such geographies, or are clustered within these geographies. It was precisely to avoid the necessity to make such arbitrary assumptions regarding customer dispersion that the Hatfield Model 's developers moved to using actual geocode data to the maximum extent possible to locate customers to their precise positions - and not to arbitrary geographies.

Our second concern is with the HCPM's determination of the local exchange carrier central office (CO) that serves particular customers. We understand that HCPM uses data from ExchangeInfo to assign customers to particular wire centers. However, in the latest version of their model, the BCPM sponsors have ceased to rely on ExchangeInfo data, because they believe that data from BLR on local exchange area boundaries, (the same data that are used by the Hatfield Model) are more accurate. The HCPM should also use the most accurate information available.

II. DROP LENGTH COMPUTATIONS IN THE HCPM DO NOT REFLECT ACTUAL DROP LENGTHS

In the HCPM, drop length is computed as a weighted average of an assumed maximum possible drop length, computed as the distance from the corner of a lot to the middle of the lot, and an assumed minimum possible drop length, computed as half the distance along the frontage of the lot. This rote method of computing the drop length could lead to implausible results. For example, the implied maximum drop length for a 500 acre ranch would be approximately 3,300 feet. In addition, it is extremely unlikely that houses would be placed halfway back in the lot, because as AT&T and MCI have previously noted in their comments, houses tend to be placed at the front of lots, both to provide larger back yards and to minimize the length of driveways.[3]

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[3] Long driveways are costly, due both to the expense of surfacing them and of clearing snow from them in non-Sunbelt areas.

AT&T and MCI have previously argued that drop lengths that reflect statistical estimates of actual drop lengths should be directly assumed within the model, rather than be computed based on a set of arbitrary unproven assumptions about lot, house, and drop configurations. Accurate "computation" of drop lengths requires several strong assumptions to be made about house size, placement of the house on the lot, and the angle at which the drop enters the lot. The HCPM developers have merely assumed that each of these parameters varies randomly between two values, giving an undeserved appearance of computational precision. AT&T and MCI urge the HCPM developers to adopt the Hatfield Model's approach of assuming drop lengths that are consistent with published nationwide averages.

III. THE HCPM CABLE SIZING ALGORITHM RESULTS IN EXCESSIVE TAPERING, AND THE HCPM'S PLANNED OPTIMIZATION PROCESS SHOULD CONSIDER LIFE CYCLE COSTS

The HCPM appears to taper cable size excessively. To determine cable size, the HCPM starts at the corner of the cell closest to an SAI which is also on a horizontal cell boundary used for distribution backbone cable. Then, beginning at the opposite corner of the cell at the intersection of four lots, the model accumulates lines and cable, following the lot boundary. When enough lines are added to require a new cable, it is added. This is repeated until either the midpoint of the cell boundary or the corner of the cell closest to the SAI is reached. At that point, cables from all cells served by the horizontal backbone cable are merged and the correct size cable is computed.

This method of determining cable size may result in a large number of changes in cable size, potentially at each lot boundary, which will require additional splices and expense. Using a large variety of cable sizes on a single job, such as throughout a Serving Area, would require loading a reel of cable of a particular size, setting up the placing operation, unloading that cable reel when a new cable size is required, and then repeating this process. Changing cable sizes repeatedly in this manner is inefficient. Therefore, outside plant engineers typically make a trade-off, using a larger cable size than necessary in some cases in order to avoid the expense of repeatedly changing out the reel of cable. To reflect this trade-off, the Hatfield Model assumes a uniform cable size for distribution side-legs, and tapers the backbone cable only once.

The HCPM chooses among 26-gauge copper, 24-gauge copper, T1 on copper, and fiber for both feeder and distribution plant. Currently, this choice is based on user input thresholds, although the developers plan in a future release to compute the crossover points as a function of other input prices for cable and electronics. If the HCPM develops this functionality, the crossover should also reflect the different lifetime costs of the plant, including maintenance costs. The Hatfield Model optimally selects whether copper or fiber feeder should be used and allows an adjustment to the amount of buried and aerial plant based on the relative lifetime costs (which includes both depreciation and maintenance expenses) of the two types of transmission media and their supporting structures. In addition, the Hatfield Model selects, within user-specified limits, the optimal mix between buried and aerial structure. The HCPM should also be modified to incorporate this optimization

IV. CONCLUSION

The customer location algorithm in the HCPM relies on Census data on customer location. By themselves, however, these data are insufficiently granular to determine accurately customer locations and clustering in sparsely populated high cost rural areas. Only use of actual geocode data and mathematical clustering techniques as used in the Hatfield Model, version 5.0, will assure sufficient but efficient modeling of distribution and feeder plant costs. In addition, the method used by the HCPM to compute drop lengths does not achieve its intended purpose, to represent the average probable drop lengths. Finally, the determination of cable size and structure mix by the HCPM needs further modification to reflect optimal engineering design practices.

Respectfully submitted,

AT&T CORP.

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November 26, 1997

STATEMENT OF VERIFICATION

I have read the foregoing and, to the best of my knowledge, information, and belief, there is good ground to support it, and it is not interposed for delay. I verify under penalty of perjury that the foregoing is true and correct. Executed on November 26, 1997.

Chris Frentrup

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CERTIFICATE OF SERVICE

I, Vivian Lee, do hereby certify that on this 26th day of November, 1997, I caused a copy of the foregoing Comments of AT&T Corp. and MCI Telecommunications Corporation to be served upon each of the parties listed on the attached Service List by U.S. First Class mail, postage prepaid.

Vivian Lee

Vivian Lee

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